RESEARCH HIGHLIGHTS

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RETROFITTING A CITY: A GUIDE FOR MUNICIPALITIES TO IMPLEMENT A BUILDING RETROFIT PROGRAM

Introduction

Municipal governments directly manage about 5% of Canada's buildings, including hockey arenas, office complexes, social housing, libraries and community centres. That represents 20 million square metres of space and over $1 billion in annual operating costs, including $280 million in energy and water bills.

Building energy retrofits have the potential to reduce those bills by 20% or more through improvements to infrastructure as well as operating and management practices. In most regions, this can also translate into significant reductions in greenhouse gas and acid gas emissions.

Within the boundaries of Canadian municipalities, there are many other buildings, owned by either private or public sector organizations, or by individuals. These also represent a very significant potential reduction in energy consumption and emissions. Municipalities have the opportunity to influence, assist, direct and motivate owners of those buildings to capture the savings.

Building energy retrofits should follow a process which includes the following steps:

- Audit – a study of the building and the way it uses energy which leads to a definition of appropriate measures
- Implement – the implementation of the measures including engineering, project management, subcontracting, and commissioning
- Monitor – the monitoring and tracking of energy savings to be sure they are achieved as expected, and they are sustained.

This AIM process, and the steps on which it is based, are described in detail throughout the manual.

In the preparation of the manual, the authors reviewed over 35 municipal energy retrofit programs across North America. Four of these were examined in greater detail, and case studies were prepared. This wealth of information forms the basis of the manual.

Scope and Delivery Method for the Program

The determination of the scope of the program is a key decision point in planning and developing a Building Energy Retrofit Program. Buildings can be categorized by:

- Ownership (municipal, public sector, private sector, individual)
- Type of Use or Occupancy (institutional, commercial, industrial, residential)
- Size (small, large)

Some municipalities start with their own buildings as a manageable first step, which offers a wide variety of building types and the ability to develop processes and build a corps of staff with the required expertise. Others set a goal of reducing energy use in all buildings contained within their borders. Retrofit programs can be designed to target any group or type of buildings within municipal boundaries.

Retrofits can be managed and/or delivered in different ways, including:

- In-house resources
- Outside Energy Management Firms
- Outsourced Program Manager
- Volunteers

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The method by which retrofits will be undertaken or delivered is an integral part of the program scope decision. Will only the program management and promotion be done in-house, or will complete engineering and project management be undertaken by municipal staff? Will volunteers be involved? Will project design and construction management be performed by in-house staff or outside consultants? Because of the variety of building ownership, types and sizes, it is likely that a portfolio of options within the program will be necessary to target individual sectors within the entire building stock.

Staffing Skills

The skills required to manage a municipal building retrofit program are wide ranging, and ideally include the following:

- **Political:** report writing, policy recommendations, the ability to make presentations to council, the public at large, the media, or stakeholders.
- **Marketing:** preparation and execution of a marketing plan, preparation of marketing materials, make direct market contacts, integrate with marketing efforts of others, ensure public recognition of individuals and organizations.
- **Technical:** ability to understand technical issues related to building retrofit, select outside consultants and advisers, ensure retrofits meet defined standards.
- **Coordination:** work with other civic departments, including building, legal, public relations, public works.

Finding the Funds

Financing requires consideration of funds for two purposes:

- "Enabling" funds to set up and operate the administration of the program, source outside legal, financial and technical expertise, and
- "Financing" funds to lend or grant to building owners to undertake retrofits.

In the case of enabling funds, the municipality may be able to provide a base level of staff, and a place for them to administer the program. Other funding sources can be:

- Utility partners
- Senior levels of government
- Retrofit industry associations
- Municipal associations
- Community minded financial institutions
- A dedicated energy retrofit investment fund

Implementation of a program to retrofit municipal buildings relies on one fundamental principle.

The Fundamental Principie for Financing Retrofits

Energy retrofits do not consume internal capital, but will generate sufficient savings to repay any investment. This will result in making funds available for other purposes.

A program for retrofitting other public and private sector buildings is usually implemented on a similar basis.

Setting up Partnerships

Partnerships will keep the project responsive to the needs of the community, and will help maintain the energy and enthusiasm required to carry on through the inevitable setbacks and difficulties. Partners can contribute financially, administratively, or politically, or they may serve as outreach or liaison associates. A few of the potential partners outlined in the guide include:

Utility partners - Utilities have a significant stake in the local community. They are usually willing to contribute to activities related to their business, including participating or assisting in programs with administrative or financial help. They are also in very regular contact with their customers through monthly or bi-monthly billings. In addition, some utilities operate very extensive demand-side management (DSM) programs which can complement a municipal retrofit program.

Senior Levels of government - The federal government has offered many different programs for municipalities to improve or retrofit their buildings. These may be offered as energy related programs through Natural Resources Canada, environmental programs through Environment Canada, tax based incentives through Canada Customs and Revenue Agency, or through general programs such as the Infrastructure Works program.

Provincial and territorial governments maintain ministries or departments of energy or the environment. These bodies focus on reducing energy use within their region, and offer some types of programs to achieve this goal. While they have been somewhat dormant through the 1990s, the changing energy landscape will bring them back into the picture in the future.

Energy Service Companies (ESCOs) - ESCOs are in business to find and implement long range solutions to energy management problems in commercial, institutional and industrial facilities. Reduced operating costs and improved performance are provided to facility owners in exchange for a portion of the savings that result. Owners enter into energy performance contracts with no capital outlay and leave the risk of program failure to the ESCO.

Federation of Canadian Municipalities - FCM recommends that municipal governments follow an eight-step process for undertaking a program of comprehensive retrofits in municipal buildings. The Sustainable Communities Guide: Municipal Building Retrofits provides detailed assistance for municipal staff to obtain senior management and council support, assess existing information and current energy use, decide what financing and implementation options work best for them, to develop the business case for a comprehensive retrofit program, and to move forward with implementation and verification of savings. The Guide provides templates, model documents, and a detailed resource manual. FCM offers three training workshops for municipal governments: Strategic Energy Planning; Spot the Energy Opportunities; Monitoring and Verification. The Sustainable Communities Guide: Municipal Building Retrofits can be obtained from FCM, along with current workshop schedules.

In 1997 the Federation of Canadian Municipalities merged with the International Council for Local Environmental Initiatives' Canadian Cities for Climate Protection™ Campaign. This united effort is now called "Partners for Climate Protection Program" (PCP).

The goal of the merged program remains to support Canadian municipal governments, to prepare and implement local climate action plans. FCM is the political partner for PCP, assuming responsibility for all formal relations with the Canadian federal government, and the formulation of federal climate policy within Canada with respect to local governments. ICLEI is the technical partner, assuming direction for activities such as software tools, technical manuals, training materials, reporting protocols, energy management, and monitoring and verification activities.

Public Expectations for Referrals to Energy Management Firms

Where a municipality develops a list of recommended or approved firms to undertake energy retrofits and offers this to program participants, the public has an expectation that all firms on that list meet a defined standard which will ensure the quality of the work they perform. A partial list of required standards would include:

- Meets provincial and/or municipal licensing standards.
- Has a defined level of experience in the services offered.
- Employs only qualified staff.
- Provides regular skills training to ensure currency is maintained.
- Has a satisfactory track record of delivering the product or service on time, at the agreed upon price, and at a satisfactory level of quality.
- Maintains insurance for public liability, property damage, and continuing operations, at coverage levels consistent with the value of the work undertaken, and with the potential liability.

Such lists must be monitored and updated on a regular basis. Part of this monitoring will include recording customer complaints, and their ultimate resolution. The municipality may offer a mediation or arbitration procedure for the resolution of any disputes.

Promoting the Program

A well-recognized retrofit program whose name becomes a hallmark that immediately identifies it in the mind of the public stands a better chance of success than one whose name is known only by a few individuals at city hall. Potential participants will want to know that the program is a legitimate enterprise from which they will benefit by becoming involved.

As soon as the program is assured of moving forward, it's a good idea to plan a kick-off event. Invite the media to witness the Mayor or other high-profile local celebrities "cut the ribbon" on the inception of the program. Invite all those who participated in the planning process, as well as current and potential partners and clients.

A municipal building energy retrofit program can benefit greatly from having one or more program champions within the municipality. Such champions will lead the discussion on program development at council meetings, act as a spokesperson at public gatherings, and may even assist with marketing the program to high profile clients. Program champions may also be drawn from the public at large where an individual is seen as having a public profile in an area consistent with the program goals and objectives.

Monitoring Energy Savings

Each program needs a clear process of monitoring energy savings, on a project by project basis. Some projects may operate on the basis of projected savings by calculation, but this is not sufficiently accurate for determining to amount of energy cost savings to be repaid to an ESCO or to a revolving loan fund. Additionally, energy savings have a tendency to be lost over time as good energy management practices are overtaken by other priorities. This can only be managed by monitoring and tracking energy use on a regular basis, and then reviewing the results.

The Full Guide

A complete copy of the Guide to Retrofitting a City can be downloaded from CMHC's Web site at the address found on the next page.

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Housing Research at CMHC

Under Part IX of the *National Housing Act*, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research.

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